

Notice of Allowability

Application No.

09/928,348

Applicant(s)

NOGUCHI ET AL.

Examiner

Marie R. Yamnitzky

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment filed April 19, 2005.
2. ☒ The allowed claim(s) is/are 1 and 3-7 (renumbered as 1-6, respectively).
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date <u>06082005</u> . |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

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An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for the examiner's amendment to claim 1 was given in a telephone interview with Patrick Gallagher on June 07, 2005. (The spelling/grammatical corrections to the specification were not discussed during the telephone interview.)

The specification has been amended as follows:

Page 3, line 4: "an" has been changed to --a--.

Page 34, line 11: "an" has been changed to --a--.

Page 47, third line from the end of the page: "an" has been changed to --a--.

Claim 1 has been amended as follows. (A complete listing of claims is provided.)

1. (Currently Amended) A polymeric fluorescent substance exhibiting visible fluorescence in solid state, having a polystyrene reduced number-average molecular weight of 1×10^3 to 1×10^8 , and containing one or more repeating units of the following formula (1), the amount of the repeating units of formula (1) being from more than 9 mol% to 100 mol% based on the total amount of all repeating units,



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wherein, Ar₁ represents an arylene group having 6 to 60 carbon atoms participating in the conjugation or a divalent heterocyclic compound group having 2 to 60 carbon atoms participating in the conjugation, each Ar₁ independently carrying at least one substituent, wherein one, and only one, substituent is a substituent represented by the below formula (2); m represents 0 or 1; R₁ and R₂ are independently selected from the group consisting of a hydrogen atom, a linear, branched or cyclic alkyl group having 2 to 20 carbon atoms, an aryl group having 6 to 60 carbon atoms, a heterocyclic compound group having 2 to 60 carbon atoms and a cyano group;

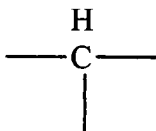


wherein, X represents -O-, -S-, or -SiR₃R₄-; and R₃, and R₄ are independently selected from the group consisting of a hydrogen atom, a linear, branched or cyclic alkyl group having 1 to 20 carbon atoms, an aryl group having 6 to 60 carbon atoms, a heterocyclic compound group having 2 to 60 carbon atoms and a cyano group; Ar₂ represents a heterocyclic compound group having 2 to 60 carbon atoms participating in the conjugation or an aryl group having 6 to 60 carbon atoms participating in the conjugation and having at least one substituent thereon; the substituents on the aryl group are selected from linear, branched or cyclic alkyl groups having 5 to 20 carbon atoms, alkoxy groups carrying a linear, branched or cyclic alkyl group having 1 to 20 carbon atom, alkylthio groups carrying a linear, branched or cyclic alkyl group having 1 to 20 carbon atoms, mono-, di- or tri-alkylsilyl groups having 1 to 60 carbon atoms, mono- or di-alkylamino groups having 1 to 40 carbon atoms, aryl groups having 6 to 60 carbon atoms and having at least

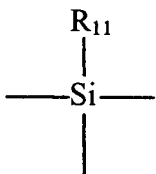
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one substituent thereon, and aryloxy groups having 6 to 60 carbon atoms, arylalkyl groups having 7 to 60 carbon atoms, and arylalkoxy groups having 7 to 60 carbon atoms;

wherein the portion represented by $-\text{CH}_3$ in the substituents on the above Ar_2 may be replaced with $-\text{SiR}_6\text{R}_7\text{R}_8$, and the portion represented by $-\text{CH}_2-$ may be replaced with $-\text{O}-$, $-\text{S}-$, or $-\text{SiR}_9\text{R}_{10}-$, the portion represented by



may be replaced with



the above R_6 , R_7 , R_8 , R_9 , R_{10} , and R_{11} each independently represent a group selected from a linear, branched or cyclic alkyl group having 1 to 20 carbon atoms, an aryl group having 6 to 20 carbon atoms, a heterocyclic compound group having 2 to 20 carbon atoms, and a cyano group; wherein one or more hydrogen atoms of the substituent on the above Ar_2 may be substituted with a fluorine atom; and when a plurality of the substituents are present on Ar_2 , they may be the same or different.

2. (Canceled)

3. (Previously Presented) A polymer light emitting device, comprising a pair of electrodes composed of an anode and a cathode at least one of which is transparent or semitransparent, and at least one light emitting layer placed between the electrodes, wherein the polymeric fluorescent substance of Claim 1 is contained in said light emitting layer.

4. (Original) A flat light source obtained by using the polymer light emitting device of Claim 3.

5. (Original) A segment display obtained by using the polymer light emitting device of Claim 3.

6. (Original) A dot matrix display obtained by using the polymer light emitting device of Claim 3.

7. (Original) A liquid crystal display obtained by using the polymer light emitting device of Claim 3 as a back-light.

Applicant is also hereby notified of the following corrections made to the specification by hand by the examiner prior to conversion of the paper file to an electronic file:

Page 14, third line after the last formula: "formular" has been changed to --formula--.

Page 25, line 4: "containning" has been changed to --containing--.

Page 34, fourth line from the end of the page: "an" has been changed to --a--.

Claim 1 has been amended to clarify that each Ar₁ may have more than one substituent, but only one substituent on each Ar₁ is a substituent represented by formula (2).

Claim 1 has also been amended to reinsert "arylalkyl groups...arylalkoxy groups..." as possibilities for the substituents on the aryl group which may be represented by Ar₂. This amendment was made at applicant's request. It was/is not necessary to delete these particular groups from the list of possible substituents in order to patentably distinguish over the prior art.

The rejection based on the article by Reisch et al. in *Macromol. Chem. Phys.* is overcome. While Reisch et al. disclose one polymer having a mono-substituted arylene group, the substituent is not a substituent of present formula (2). Reisch et al. provide no motivation to modify the mono-substituted arylene group to provide a single substituent of formula (2). Reisch et al. teach that mono-substitution is inferior to di-substitution. The di-substituted arylene groups disclosed by Reisch et al. have two identical substituents. Reisch et al. do not suggest arylene groups substituted with two (or more) inequivalent substituents.

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The rejection based on the patent to Hsieh (US 5,817,430) is overcome. The three specific monomers referenced by the examiner in the Office action mailed October 20, 2004 do not provide polymers within the scope of currently amended claim 1. While polymers of repeating units of present formula (1) may be within the broad disclosure of the Hsieh patent, there is no disclosure of a specific monomer capable of providing a polymer meeting the present claim limitations, and no specific teachings that would lead one of ordinary skill in the art to the presently claimed polymer.

The following is an examiner's statement of reasons for allowance:


The prior art does not disclose or suggest a polymeric fluorescent substance containing repeating units as defined in present claim 1.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax number for Art Unit 1774 is (703) 872-9306 for all official faxes. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

MRY
June 08, 2005


MARIE YAMNITZKY
PRIMARY EXAMINER

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